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CURRENT EDUCATIONAL WRITINGS

I. REVIEW OF RECENT LITERATURE ON SECONDARY-SCHOOL MATHEMATICS

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The discussion of writings on mathematics has been limited to textbooks and articles dealing with some phase of secondary mathematics, including reports of committees. For the purpose of convenience these articles have been classified as follows:

1. Discussions of the values of mathematics as a high-school subject. Among teachers of mathematics this topic probably has aroused more interest during the past year than any other.

2. Suggestions for improving methods, arrangement of material, requirements for graduation, interest on the part of the pupil, and means for developing greater skill in the mathematical processes.

The reviews which follow are arranged in this order:

THE EDUCATIONAL VALUE OF HIGH-SCHOOL MATHEMATICS

1. "Teaching of Elementary Mathematics." By Louis C. Karpinsky. *School and Society*, January 20, 1917.

Efficiency, says the writer, is the watchword of modern business. The details involved in manufacture are examined critically. Public education should be subjected to the same critical scrutiny.

Critical examination of the study of mathematics is being made and progress along the following lines:

a) Correlation is worked out between several branches of mathematics and between mathematics and life.

b) The historical development of mathematics is receiving more attention.

c) The details of the teaching of mathematics are being studied.

d) The trigonometrical relations receive recognition in plane geometry.

e) The number of problems and illustrations in applied design, and of other practical applications, is increasing.

f) The study of *formal* geometry is preceded by an introductory course.

g) Graphs are introduced in algebra.

2. "Report of the Committee of the New England Association of Teachers of Mathematics on Secondary School Mathematics." *Mathematics Teacher*, April, 1916.

This report gives a study of the present status of secondary-school mathematics and a discussion of the fundamental issues. Some of the educational values of mathematics are considered in detail and a comparison is made of the curricula of American schools with the schools of European countries.

The committee reaches some important conclusions and makes recommendations regarding high-school requirements in mathematics, college-entrance requirements, the curriculum, and the preparation of teachers.

3. "The Place of Mathematics in the High School." By Raleigh Schorling, F. A. Kahler, and O. M. Miller. *School Science and Mathematics*, October, 1916.

This is a report of the committee appointed by a club of teachers of mathematics in the city of Chicago to investigate the current criticisms of high-school mathematics.

The committee gives a long and thorough discussion of the values of high-school mathematics. It also suggests the type of mathematics that should be required in the future high school.

4. "The Value of Mathematics as a Secondary-School Subject." By Harriet R. Pierce. *School Science and Mathematics*, December, 1916.

Miss Pierce argues that mathematics is an excellent subject for forming habits of study, such as neatness, accuracy, and concentration.

5. "Required Mathematics." By A. R. Crathorne. *School and Society*, 1917.

The criticisms of high-school mathematics are considered, and comment is made upon the signs of interest among teachers of mathematics. It is shown that the more constructive criticisms are resulting in such forward movements as correlation and the laboratory method.

The problem of formal discipline also receives some consideration. In the usefulness of mathematics we find arguments for both the formal and the useful side of algebra.

6. "Reasons for Studying Algebra." By George W. Myers and George E. Atwood. *Elementary Algebra.* Scott, Foresman & Co.

This excellent statement of the case of algebra should be read by every teacher interested in secondary education.

7. "The Bearing of the New Psychology upon the Teaching of Mathematics." By Agnes L. Rogers. *Teachers College Record*, September, 1916.

This article gives a review of experimental investigations in algebra and geometry. It discusses the amount of correlation between efficiency in mathematics and efficiency in other subjects and reviews the established results regarding transfer of training.

Miss Rogers draws the following conclusions to bring about improvement in the teaching of mathematics:

a) A proper attitude is to be cultivated in the pupil.

b) More attention is to be focused on the art of learning and the methods of procedure in solving problems.

c) Attention is to be directed to related ideas in order that as many as possible be recalled.

d) Motivation should be secured and attention should be kept at a high level.

8. "School Mathematics and War." By G. A. Miller. *School and Society*, October 21, 1916.

The purpose of the article is to show the usefulness of mathematics to the soldier.

9. *Problems of Secondary Education.* By David Snedden. Houghton Mifflin Co.

Mr. Snedden's views and criticisms are widely known and have aroused a great deal of discussion, partly because they are of the constructive type. Every teacher of high-school mathematics should be familiar with the chapter in this book which deals with mathematics.

IMPROVEMENT OF METHODS

1. "Supervised-Study Plan." By Carl H. Nielson. *School Review*, March, 1917.

The principal features of the plan are, first, special conferences of pupils who have fallen behind with the instructor; secondly, teaching of the group as a whole how to study.

2. "Teaching Pupils to Study." By F. W. Johnson. *School Review*, November, 1916.

An appeal to teachers to make careful studies of the teaching process and to publish the methods used and the results.

3. "Supervised Study in the Everett High School." By Alexander C. Roberts. *School Review*, December, 1916.

4. "Results of Supervised Study in the Houghton, Michigan, High School." By John E. Erickson. *School Review*, December, 1916.

5. "Supervised Study." *School Review*, October, 1916.

This article gives a list of schools experimenting in supervised study.

6. "A University How to Study Class." By Herbert G. Lull. *School and Society*, December, 1916.

A plan is described which aims to develop the study habit of a class of college students taking a course in civil engineering. The article contains many points of value to the teacher of high-school mathematics.

7. "Supervised Study." By Thomas R. Cole. *School Review*, May, 1917.

8. "Supervised Study." By I. M. Allen. *School Review*, June, 1917.

9. *How to Study Effectively.* By G. M. Whipple. Public School Publishing Company, Bloomington, Indiana.

This little book gives valuable directions in teaching effective methods of study.

ARRANGEMENT OF THE CONTENT OF A COURSE IN HIGH-SCHOOL MATHEMATICS

1. "Unification of Mathematics in the High School." By W. D. Reeve. *School and Society*, August 5, 1916.

It is argued that unifying of high-school mathematics may help to settle many of the controversies that have arisen.

2. "Unification of Mathematics in the High School." By H. C. Wright. *School and Society*, October 7, 1916.

This article contains definite references to experiments in unification. The economy of the plan is emphasized. It is suggested that courses offered in schools of education give opportunity for better training of teachers.

3. "Report of the Committee on Geometry." By E. R. Breslich, Ernest B. Lytle, and Irwin M. Miller. *School and Society*, January 13, 1917.

An outline of a course in geometry beginning in the elementary school and continued through the high school.

4. "A Course of Study in Secondary Mathematics in the University High School." By E. R. Breslich, Raleigh Schorling, Horace C. Wright, and Harry N. Irwin. *School Review*, November, 1916.

An outline of the aims, values, and content of the course in mathematics given in the University High School.

5. "Administrative Aspects of the High School." By Franklin W. Johnson. *Education*, June, 1917.

Principal Johnson suggests that the requirement for formal algebra and geometry give place to a single year devoted to the study of the essential number and space relationships of algebra, geometry, and trigonometry, built upon a mastery of the essentials of arithmetic.

6. "The Content of a Mathematical Course for the Junior High School." By F. W. Gentleman. *The Mathematics Teacher*, June, 1917.

The writer advocates for the first year a review of the fundamental operations of arithmetic, some very simple algebra, and mensuration; for the second year, a review of arithmetic, formulas, percentage, geometric constructions, and simple equations in one or two unknowns; for the third year, a review of arithmetic, formulas, linear equations, factoring, quadratic equations, an introduction to a systematic study of the theorems of geometry.

7. "Possibilities of the Junior High School." By Thomas H. Briggs. *Education*, January, 1917.

It is proposed that mathematics, instead of being confined to the higher reaches of arithmetic, should concern the general applications of arithmetic and introduce the more practical elements of algebra, constructive geometry, and even trigonometry.

8. "Mathematics in the Junior High School." By David Eugene Smith. *Educational Review*, April, 1917.

This article recommends a systematic and topical arrangement of arithmetic, constructive geometry, formulas, elementary algebra, and formal algebra.

9. "College-Entrance Mathematics." By George V. Dearborn. *School and Society*, October, 1916.

The question of the usefulness of algebra is raised in connection with the discussion of the mathematical requirements of the College-Entrance Examination Board.

10. "Tests and Examinations." By H. T. Terry. *School and Society*, October 28, 1916.

Suggestions are made for the changes in the nature and methods of examinations.

MEANS OF DEVELOPING SKILL IN MATHEMATICS

1. "Standardized Tests and the Improvement of Teaching in First-Year Algebra." By H. O. Rugg and J. R. Clark. *School Review*, May, 1917.

The authors have worked out a number of standardized tests for the fundamental operations of first-year algebra. They hope that the efforts to establish standards will have considerable effect upon the teaching of algebra and that the standardized tests will serve as a device for the improvement of teaching this subject.

2. *Standardized Practice Exercises in First-Year Algebra.* By H. O. Rugg and J. R. Clark, Chicago, Illinois.

These tests will serve as a device for improving such fundamental processes of algebra as collecting terms, solution of simple equations, substitution, removal of parentheses, subtraction, manipulation of exponents, finding special products, factoring, solving quadratic equations, clearing of fractions, solving simultaneous equations, and simplifying radicals. The tests are so arranged that a student can easily grade his own or another student's paper.

3. *Geometry Tests.* By J. Minnick, University of Pennsylvania.

Mr. Minnick has sent copies of his tests to a number of schools for trial. So far as the writer knows, he has not published his results.

MEANS OF AROUSING GREATER INTEREST IN THE STUDY OF MATHEMATICS

In *School Science and Mathematics* we find a number of brief articles dealing with this question. Many of these articles contain simple reading matter which a high-school pupil may study with profit. They make excellent material for reports to a class or to a mathematics club. Such use of these articles is to be recommended.

1. "A Mathematical Victory, A Play in Two Acts." By The Mathematics Club of the Los Angeles State Normal School of California. *School Science and Mathematics*, June, 1917.

2. "History and Use of Mathematical Textbooks." By G. A. Miller. *School and Society*, December 16, 1916.

Students are advised to broaden their mathematical notions by reading articles relating to the subject. Historical notes are said to intensify the pupils' interest.

3. "A Mathematical Contest." By Edgar T. Boughes. *School Science and Mathematics*, April, 1917.

This contest was arranged between pupils of the Manual Arts High School of Los Angeles and the Pasadena High School.

4. "Mathematics Contests." By Ernest H. Koch. *Mathematics Teacher*, June, 1917.

5. "Mathematics Clubs." By Louise Webster. *Mathematics Teacher*, June, 1917.

6. "The Half-Angle Formula Derived by Line Values." By G. W. Armstrong. *School Science and Mathematics*, April, 1917.

7. "The Use of the Radical Symbol." By G. A. Miller. *The Mathematics Teacher*, March, 1917.

NEW TEXTBOOKS

1. First Course in Algebra. By Herbert E. Hawkes, William A. Luby, and Frank C. Touton. Ginn & Co. Pp. ix+301.

A revision of the *First Course in Algebra.* It differs from the older edition in omitting such topics as "Highest Common Factor" and "Least Common Multiple." It also contains many new problems and exercises. New ideas and operations are usually introduced with sets of oral exercises. It is aimed to present the subject with greater simplicity than the older text.

2. *Elementary Algebra.* By Elmer Lyman and Albertus Darnell. American Book Company. Pp. vii+503.

The authors aim to secure simplicity by omitting unduly puzzling exercises and non-essentials, at the same time satisfying the requirements of the College-Entrance Examination Board. The book contains considerable correlation with arithmetic.

3. *Elementary Algebra.* By George William Myers and George E. Atwood. Scott, Foresman & Co. Pp. 338.

A clear and simplified treatment of a first-year course in algebra. A book which the pupil should be able to read and understand. The practical value of algebra is emphasized. An important feature of the book are the frequent reviews and numerous practice exercises.

4. *Complete Algebra.* By H. E. Slaught and N. J. Lennes. Allyn & Bacon. In two parts. Pp. x+373 and pp. v+256, respectively.

The authors follow the traditional course in algebra, aiming to present the subject in a simple manner. The book contains a large number of illustrative examples, review exercises, and lists of problems taken from college-entrance examinations. Historical notes and portraits of mathematicians add to the interest of the student.

5. *Plane Geometry.* By Durell and Arnold. Charles E. Merrill Co. Pp. 300.

An improvement in the methods of teaching pupils to solve original exercises. The number of propositions is reduced and corresponds closely to the Harvard *Syllabus* and to the report of the Committee of Fifteen. The theory of limits and incommensurable cases are omitted.

6. *Plane and Solid Geometry.* By John C. Stone and James F. Millis. Benjamin Sanborn & Co. Pp. x+448.

A revision of the older plane and solid geometry. The principal aims of the book are simplicity of presentation and emphasis upon practical problems.

7. *Plane and Solid Geometry.* By William Betz and Harrison E. Webb. Ginn & Co. Pp. xi+507.

An exceedingly attractive book, which should be found on every teacher's desk.

8. *First-Year Mathematics.* By George W. Evans and J. A. Marsh. Charles E. Merrill Co. Pp. 253.

As the title indicates the course contains more than algebra, including a considerable amount of geometry. Many concrete problems may be found in the book.

9. *Introduction to Mathematics.* By Robert L. Short and William H. Elson. D. C. Heath & Co. Pp. viii+210.

A correlation of arithmetic, algebra, and straight-line geometry. The book contains a large number of applied problems.

10. *Second-Year Mathematics.* By E. R. Breslich. The University of Chicago Press. Pp. xx+348.

This is the second of the series of textbooks on secondary mathematics designed as a second unit of a year's work and following the first course worked out by the author in *First-Year Mathematics.* It completes the study of plane geometry, continues the study of algebra and solid geometry, and begins trigonometry.

11. *Plane Geometry.* Edith Long and W. C. Brenke. Century Co. Pp. vii+276.

The practical side of geometry is emphasized. The introduction of the trigonometric functions in the chapter on ratio and proportion and of numerous geometric exercises to be solved algebraically is a step in the direction of correlated mathematics.

II. BOOKNOTES AND REVIEWS

TRYON, R. M. *Household Manufactures in the United States, 1640 to 1830:* A Study in Industrial History. Chicago: The University of Chicago Press. Pp. 412. $2.00.

Professor Tryon affirms that a history of any special phase of the life of a people, to be of value, should not be treated in isolation from the various other phases of that people's life. In presenting *Household Manufactures in the*